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CLAIM(S)

What is claimed is:

1. A knife and ballistic projectile penetration resistant article, comprising, in order:

a first plurality of layers of fabric made of fibers;

a second plurality of layers of fabric made of fibers, each of the layers being substantially surrounded and impregnated by a corresponding polymeric matrix comprising a thermoset resin, a thermoplastic resin, or mixtures thereof; and

a third plurality of layers of woven fabric made of fibers,

wherein the fibers of the first, second and third plurality of layers have a tenacity of at least 10 grams per dtex and wherein the first, second and third plurality of layers combined have an areal density of no more than 6.9 kilograms per square meter.

2. The article of claim 1, wherein the first plurality of layers comprises about 2 to about 10; the second plurality of layers comprises about 5 to about 30 layers; and the third plurality of layers comprises about 10 to about 40 layers.

3. The article of claim 1, wherein yarn of the first, second and third plurality of layers has a linear density of about 100 dtex to about 3300 dtex, and the fibers of the first, second and third plurality of layers have a linear density of about 0.5 dtex to about 4 dtex.

4. A spike, knife and ballistic projectile penetration resistant article, comprising, in order:

a first plurality of layers of fabric made of fibers;

a second plurality of layers of fabric made of fibers, - each of the fabric layers being substantially surrounded and impregnated with a corresponding polymeric matrix comprising a thermoset resin, a thermoplastic resin, or mixtures thereof;

a third plurality of layers of woven fabric made of fibers; and

a fourth plurality of layers of tightly woven penetration resistant fabric made of fibers, the tightly woven fabric having a fabric tightness factor of at least 0.75,

wherein the fibers of the first, second, third and fourth plurality of layers have a tenacity of at least 10 grams per dtex and wherein the first, second, third, and fourth plurality of layers combined have an areal density of no more than 7.8 kilograms per square meter.

5. The article of claim 4, wherein the first plurality of layers comprises about 2 layers to about 10 layers; the second plurality of layers comprises about 8 layers to about 25 layers; the third plurality of layers comprises about 10 layers to about 40 layers; and the fourth plurality of layers comprises about 2 layers to about 20 layers.

6. The article of claim 4, wherein

yarn of the first, second, and third plurality of layers has a linear density of 100 to 3300 dtex, and the fibers of the first, second, and third plurality of layers have a linear density of 0.5 to 4 dtex; and

yarn of the fourth plurality of layers has a linear density of 100 to 1700 dtex, and the fibers of the fourth

plurality of layers have a linear density of 0.5 to 2.5 dtex.

7. The article of claim 4, wherein an outer face of the fourth plurality of the layers is the strike face for penetration threats.

8. The article of claim 1 or 4, wherein the fibers of each of the plurality of layers are selected from the group consisting of polyamide fibers, polyolefin fibers, polybenzoxazole fibers, polybenzothiazole fibers, poly{2,6-diimidazo[4,5-b4',5'-e]pyridinylene-1,4(2,5-dihydroxy)phenylene}, and mixtures thereof.

9. The article of claim 1 or 4, wherein the fibers in each of the plurality of layers are para-aramid.

10. The article of claim 1 or 4, wherein the fibers in each of the plurality of layers exhibit elongation to break of at least 1.5% and a modulus of elasticity of at least 200 grams per dtex.

11. The article of claim 1 or 4, wherein yarns of at least one layer of the first or second layers are woven.

12. The article of claim 1 or 4, wherein yarns of at least one layer of the first or second layers are non-woven.

13. The article of claim 1 or 4, wherein the article meets at least the Level 1 performance requirement against edge blades as described in NIJ Standard-0115.00; and the article meets at least the Type IIA ballistic performance requirement as described in NIJ Standard-0101.04.

14. The article of claim 4, wherein the article meets at least the Level 1 performance requirement against spike as described in NIJ Standard-0115.00.

15. The article of claim 1 or 4, wherein the polymeric matrices have a tensile strength of at least 10 MPa, and the polymeric matrices have a flexural modulus of at least 50 MPa.